NAVY SMALL BUSINESS INNOVATION RESEARCH PROGRAM
Submitting Proposals
On Navy Topics

Phase I proposal (10) copies should be addressed to:

Topics #1 through #74

Headquarters, Naval Sea Systems Command
Department of the Navy
Washington D.C., 20362
Attn: Code: 003
SBIR Program

Topic #75 through #94

Headquarters, Naval Electronic Systems Command
Department of the Navy
Washington D.C., 20360
Attn: Code 00k
SBIR Program

Topic #95 through #114

Headquarters, Naval Air Systems Command
Department of the Navy
Washington D.C., 20361
Attn: Code: Air 303
SBIR Program

Topic #115 through #124

Office of Naval Research
800 North Quincy Street
Arlington, VA 22217
Attn: Code: 400
SBIR Program

Topic #125 through # 130

Director, Development Center
Marine Corps Development and Education Command
Quantico, VA 22134
Attn: Legal Counsel
SBIR Program

Topic # 131

Joint Cruise Missiles Project Office
Director of Contracts (JCM-28) (SBIR Program)
Washington D.C., 20360

N83-001 TITLE: Architecture and Tools for Integration of Office Automation and Data Processing

CATEGORY: Exploratory Development

DESCRIPTION: The development and integration of major information systems remains a difficult problem. New challenges are being presented by the need to couple information systems with modern office automation technologies. Although local area networks can provide communications level support, applications definition, development and integration are still key obstacles. Recently, new concepts in systems architecture have been emerging. These concepts involve placing specialized functions in several processors for multi-computer/multi-user support. As an example, hardware-based databases machines are not being used to provide databases services to computers and users in a network environment. This frees resources on each computer in the system for applications efficiency. A further example of offloading intelligence is the development of prototype systems have been developed which can automatically produce programs for information systems, without actual programming, by entering system specifications. Theses developments suggest new approaches to requirements for integrated data processing/office automation, appropriate architectures can be developed and prototyped. These architectures would contain system development tools as integral components.

System developments based on architectures which provide functional and development tools would proceed with greater possibility of success, should have low maintenance costs, and should be open to integration of new applications. These benefits would improve the effectiveness and economy of information/office systems.

N83-002 TITLE: Detection/Neutralization of Buried Mines

CATEGORY: Exploratory Development

DESCRIPTION: Mines buried in the sea bottom are difficult (often impossible) to detect and post a significant threat to out mine countermeasures operating units. Various means must be investigated to provide a reliable method to determine a mine's presence and subsequent high rate of mine neutralization. The ability to detect and classify objects buried in the sea bottom will greatly enhance mine clearance/neutralization efforts by our countermeasure complexity of the mind clearance problem will be reduced, optimum allocation of critical resources (between minesweeping and minehunting) can be made and port breakout concepts can be solidified.

N83-003 TITLE: Non-Jammable Local Precise Navigation for MCM Operations

CATEGORY: Exploratory Development

DESCRIPTION: Navigation aids are required to allow our MCM forces to transit known and suspected minefields in a precise manner and provide positive open sea-lanes and gates through which friendly forces may pass. The ability to precisely neutralize specific/selected water areas will reduce the number of occasions and locations where dedicated MCM forces are required to assure safe passage of our combatants and support vessels. High rate clearance operations will be realized since valuable station/operating time will not be required for repetitious passes to assure navigation error has been compensated for.

N83-004 TITLE: Shipboard Non-Tactical ADP Program Applications of the Future

CATEGORY: Exploratory Development

DESCRIPTION: The Navy is currently in the process of automatic shipboard logistics functions under the auspices of the Shipboard Non-tactical ADP Program (SNAP). However, because of the rapidly changing and improving technology of automated information processing (including miniaturization of hardware, telecommunications, software and database management advances), the time is now to begin developing and optimizing follow-on integrated systems of the future. Ongoing development of logistics systems, employing state-of-the-art automated information system (AIS) technology that is in pace with automation of the tactical community, is essential to

ensuring the optional readiness of the Fleet. Reduced manning profiles of our newer ships demand that support functions be conducted as efficiently as possible with minimal manual intervention.

N83-005 TITLE: Diver Display

CATEGORY: Exploratory Development

DESCRIPTION: Diver Head Mounted visual display for object location in turbid or dark waters – new technology, though minimum investigation has been conducted. Divers are currently restricted by visual limitations and have difficulty in deploying from their underwater platform/vehicle for an appreciable distance and be able to return with surety.

N83-006 TITLE: Alternatives to Organometallic Antifouling Paints

CATEGORY: Exploratory Development

DESCRIPTION: Organometallic antifouling paint development (e.g., organotin, organolead, organoarsenic, etc.) has been the dominant thrust of antifouling paint research since the mid-1960's. this emphasis has included virtually no research into methods of improving the presently used cuprous oxide based paints or the development of non-metallic (or non-organometallic) paints. As a consequence the performance obtained from copper based antifouling paints has decreased from that obtained earlier. Increasingly stringent industrial safety and environmental regulations are restricting the use of organometallic based paints with the result that the Navy now has poorer quality antifouling pain performance that it had prior to recent paint developments. Should have increased ship performance, achievement of long-drydocking cycles, reduced fuel consumption, and reduced costs associated with the use of antifouling paints by using safer toxicants.

N83-007 TITLE: Fire Retardant and Protective Coatings

CATEGORY: Exploratory Development

DESCRIPTION: Some materials aboard ship are degraded by head and/or fire. These materials are plastic, insulating foam and aluminum. Current Navy coatings will not protect these materials in a full-scale fire situation. Benefits derived from these materials will relate directly to ship survivability and personnel safety. These new materials will be developed to keep a ship in service in the event of serious fire.

N83-008 TITLE: Acoustical Flexible Anti-Sweat Foam Insulation

CATEGORY: Exploratory Development

DESCRIPTION: There is a need to develop and acoustical insulation for use in the machinery spaces and duct work which does not absorb oil or moisture. The material presently used for this application is fibrous glass with a vapor barrier. If the vapor barrier is breached, the glass soaks up oil or moisture causing it to become a fire hazard or not perform its insulation job properly. The use of an acoustic insulation which does not absorb oil or moisture will greatly reduce the fire hazard in machinery spaces and reduce the corrosion problem associated with duct work.

N83-009 TITLE: Light Weight Fire Insulation

CATEGORY: Exploratory Development

DESCRIPTION: Presently the Navy is using ceramic insulation to protect aluminum structures and Kevlar ballistic armor from fire; aluminum will melt and loser structural integrity and Kevlar armor will burn and liberate toxic

gases which will inhibit fire fighting. The present material is heavy and adds substantial weight to the ship. New methods of manufacturing and new materials which are lighter in weight should be developed. Topside weight will be saved while the ship's structure will be to better withstand the problem a fire presents and allow the ship to survive what might be a catastrophic fire.

N83-010 TITLE: Fume Tight Door Materials

CATEGORY: Advanced Development

DESCRIPTION: Adequate seal on quick acting door that will provide a fume tight barrier – solution requires development of gasketing materials, gasket installation, door/hinge design along with interface/structure of bulkhead that can give better than 75% efficiency and will last. Improved safety and habitability – prevents the ingress of noxious fumes into crew living/messing areas.

N83-011 TITLE: Composite Structures and Containment Vessels

CATEGORY: Advanced Development

DESCRIPTION: Develop and utilization of lightweight, inexpensive, seawater resistant materials to be used as strength members and containment vessels of various shapes and size. Light weight and inexpensive materials will result.

N83-012 TITLE: Radar Cross Section Coatings

CATEGORY: Exploratory Development

DESCRIPTION: Combatant craft are readily detected by radar in hostile areas. Based on recent investigations it has been shown that operational effectiveness can be improved with usage of Radar Cross Section (RCS) camouflage. SEAFOX applications have indicated that the RCS to the maximum we will require a light inexpensive, simple to manufacture Radar Absorptive Material (RAM). RAM should be suitable to marine environment, readily maintainable with no change in craft configuration. Much work had been accomplished in this area by NSWC, Dahlgren; NWSC, Crane; and NRL. Specific benefits accrued would be realized in the crafts improved operational effectiveness and survivability.

N83-013 TITLE: MW Tactical Theory and Planning Methodology

CATEGORY: Exploratory Development

DESCRIPTION: Development of minefield and mine countermeasure theory and related analytical models which can treat the entire stockpile-to-target sequence and be used to evaluate complex multiport and campaign level scenarios. Near term application of this improved methodology will allow mire realistic predictions of the effectiveness of various minefield designs; permit more efficient utilization of available mining assets; provide a capability to accurately determine stockpile requirements; and realistically compare the attributes of new mine design concepts.

N83-014 TITLE: Shipboard IC Circuit to "Net" Administrative Computers

CATEGORY: Exploratory Development

DESCRIPTION: Development of a Shipboard Interior Communications (IC) circuit for use by administrative computers to transmit information for management of ship functions, perform equipment maintenance, determine

supply support availability. This will: (a) enhance use of administrative computers; (b) improve maintenance actions; (c) reduce maintenance manhours; and (d) reduce equipment downtime.

N83-015 TITLE: Acoustic Lens

CATEGORY: Exploratory Development

DESCRIPTION: Develop materials which can shape/direct acoustic energy with minimal loss of power to eliminate side lobes. Weapon systems and platforms would be more effective and have a better chance for survival. Fleet Operations should be improved. Money, manpower and time will be directly saved. The systems using this improved technology will become more effective.

N83-016 TITLE: Underwater Management/Metal Detector

CATEGORY: Advanced Development

DESCRIPTION: During deep submergence search operations using STSS or DSV's items of interest are not detected because of submergence in soft bottoms or due to a covering of silt, sand, etc. A metal detector/magnetometer which could be attached to search vehicle and which would be operable to 20,000 feet is needed. This will increase the effectiveness of search missions decreasing required search time.

N83-017 TITLE: Improved Thermal and Acoustical Insulating Materials or Techniques

CATEGORY: Exploratory Development

DESCRIPTION: Improve Thermal/Acoustical Insulating Materials/Techniques Survey materials and techniques for insulating combatant craft thermally and acoustically. By comparative test data determine materials/techniques to be specified in new construction which will use improved insulating materials, lighter in weight, easier to apply, less costly and less fire risk. (1) List thermal and acoustical insulation materials/techniques currently used aboard U.S. Navy Ships. (2) Survey the insulation materials/techniques currently used aboard for commercial ships and foreign Navy ships, where possible. (3) Survey insulation goal is improved insulation for land based construction. (4) Perform lab/craft tests where needed. The goal is improved insulating materials, lighter in weight, easier to apply, less costly and less fire risk.

N83-018 TITLE: Feasibility Study on Use of Inflatable Boats as Target Drones

CATEGORY: Advanced Development

DESCRIPTION: The present Target Drones (18' TD) and (54' TD) are designed to be "expectable" but they are not cheap to buy. An inflatable boat with outboard motor can reach comparable speeds, carry same loads at much less cost under 5,00.00 each. A rigid metal or wood floor board can old the same equipment at considerable savings.

N83-019 TITLE: Install a remote indicating fire and flooding alarm systems on boats/craft

CATEGORY: Advanced Development

Description: To enhance the safety of craft left unattended in the water by decreasing the possibility of loss from a fire or flooding hazard through installation of a remote indicating fire alarm system. This system will provide the user activity with a means of remote indication of fire or flooding onboard unattended craft and facilitate the dispatch of emergency services. A system consists of a central monitor, repeater(s), transmitter(s), and sensor(s). Operation is via ling range telemetry, no wore is required.

N83-020 TITLE: Need 6-8 man capacity inflatable lifeboat

CATEGORY: Advanced Development

DESCRIPTION: There is a need for a small, (6-8 man capacity) inflatable life raft for the smaller combatant craft. This raft would be capable of inflating in cold temperatures, be vulcanized, inherently stable in sea states of 4 or 5. Present life rafts are the 15, and 25 man size; too heavy foe smaller craft. New technology is not needed since the preliminary design parameters have been explored in the recent development of the Helicopter Extractable Cold Weather Life craft. The survival of combatant craft crewmen will have a life craft for use in an emergency that can be depended upon in areas of cold weather operations.

N83-021 TITLE: Decoys for Combatant Craft

CATEGORY: Exploratory Development

DESCRIPTION: Combatant craft need inflatable decoys that have the heat source, sound, and radar signatures to confuse incoming missiles. These could be stowed aboard the craft and deployed near the mother craft when needed. The benefits to the Navy would be the preservation of Fleet Combatant Craft and their crews. Each combatant craft will immediately become more effective.

N83-022 TITLE: Shipboard Carbon Dioxide Laser

CATEGORY: Advanced Development

DESCRIPTION: Battle Ground anti-air warfare (AAW) capability would be greatly enhanced by the availability of a medium power carbon dioxide laser afloat. The laser would be used against anti-ship cruise missiles. Technology exists to produce such a carbon dioxide (CO_2) laser system. Experimental data demonstrates that an operationally useful damage mechanism would be attained. This effort would begin with a detailed design. Phase II would be manufacture of an advanced development model.

N83-023 TITLE: Enhanced Chemical Laser Efficiency

CATEGORY: Exploratory Development

DECRIPTION: Chemical laser system efficiency could be greatly improved if higher energy density reactants were developed. This effort would begin with screening of reactants suitable for CW chemical operation (requirements classified). Initial equilibrium combustion testing and reaction product analysis is desirable. Phase II might entail subscale synthesis of sufficient quantities of candidate reactants for subscale laser tests at a Government-owned facility.

N83-024 TITLE: Optical Coatings for Pulsed Chemical Lasers

CATEGORY: Exploratory Development

DESCRIPTION: High reflectance coatings capable of withstanding high peak and average power levels are required. The contractor should be capable of developing coating materials, designs, and deposition techniques necessary for pulsed chemical laser applications (requirements classified). An initial survey of existing materials and techniques is suggested, followed by screening or development of advanced approaches. The second phase of this SBIR effort would be actual coating of witness samples and survivability.

N83-025 TITLE: Safety Improvements to Lithium-Based Power Sources

CATEGORY: Engineering Development

DESCRIPTION: The Navy has great interest in the increased shelf life and energy density of lithium-based power sources when compared with conventional units. However, numerous incidents have shown that lithium chemistry includes failure processes tat present serious hazards to equipment and personnel. The contractor will evaluate the chemistry and production methods of various commercial lithium-sulfur dioxide or lithium-thionyl chloride cells, and propose a chance in materials, configuration, production process, or quality control that will demonstrably increase safety without significantly decreasing the positive characteristics. The proposal will include a cost and schedule plan, including testing, evaluation, and safety, reliability and, producibility analysis and demonstrations.

N83-026 TITLE: Passive Underwater Target Detecting Devices

CATEGORY: Advanced Development

DESCRIPTION: The most effective naval mines contain a device capable of detecting the location, course, and type of potential underwater or surface target vessels at a distance without generating signals from the mind. The contractor will define an approach based upon proven technology, conduct an analysis to determine the operational characteristics (range, accuracy, noise immunity, power consumption, etc.) of the device, and prepare a development plan describing the cost and schedule for all phases: design, fabrication test, evaluation, reliability and producibility reviews, production, and logistics support.

N83-027 TITLE: Efficacy of Automatic Stud Welding

CATEGORY: Engineering Development

DESCRIPTION: Determine the limits of surface contamination (e.g., paint, dirt, grease, fouling, water, etc.) for successful stud welds from an automatic production stud welding machine.

N83-028 TITLE: Software Safety Analysis

CATEGORY: Engineering Development

DESCRIPTION: Conduct an independent safety analysis for computer programs associated with nuclear weapons.

N83-029 TITLE: Ship Systems Initiatives, Justifications, and Prioritization

CATEGORY: Exploratory Development

DESCRIPTION: Describe ship systems initiatives, derived from the basic Ship/Systems Initiative Development (SID) Program in sufficient depth to provide:

1. Program managers with data, required performance capabilities, trade-offs, and risks to plan and justify each initiative.

2. Decisionmakers with the above, in a form most useful to show the inter-relationship with existing RDT&E programs, relation to future ship acquisition and for prioritizing the initiatives.

Presently, new R&D efforts are generally product improvements and prioritization is established by best judgment. The SID Program identifies ship system initiatives based on performance shortfalls or inefficiencies. In addition, the SID process identifies alternative solutions to these shortfalls that result in initiatives.

An in-depth analysis of these initiatives is required to determine expected performance capabilities, technology and schedule risks, application/ utilization and comparisons and for trade-off with other initiatives or existing R&D programs.

Analyses of requirements are to be performed to determine a method of data presentation necessary to meet objective 2 stated above.

These data would also provide an essential input to the CONFORM, EPA, and specific ship design and acquisition programs.

Phase I effort is to establish a method to conduct the initiative analyses.

N83-030 TITLE: Anti-Air Missile Warhead Catalog

CATEGORY: Exploratory Development

DESCRIPTION: Prepare a catalog of U.S. non-nuclear Anti-Air Missile warhead investigations initiated or developed over the past twenty (20) years. The investigations considered are to include but not be limited to production or operational items. Also to be included are those technology designs, concepts, and studies that were initiated but terminated prior to successful completion.

Information to be compiled should include but not be limited to:

- name or title
- place and period of investigation/development
- present status
- physical characteristics
- drawing/sketch/photograph
- if terminated – reason for termination
- references/sources of information

N83-031 TITLE: Solid Fuel Ramjet – Fuels and Combustors

CATEGORY: Exploratory Development

DESCRIPTION: Efforts are needed in several areas: (a) Alternate fuels should be evaluated which have attractive potential performance characteristics for both volume limed and weight limited applications. Propose research effort to evaluate the practicability of efficient combustion of these fuels. (b) Additional combustion characterization is needed (grain regression rate versus pressure, etc.) for existing solid fuels and grain designs. Opportunities exist for both analytical and experimental contributions in this area. (c) Innovative ideas are needed for practical methods of fuel flow control during combustion, and/or practical methods of vehicle speed control to permit optimum performance.

N83-032 TITLE: Hypersonic Air Breathing Engine Fuel Control

CATEGORY: Exploratory Development

DESCRIPTION: Innovative conceptual designs are needed for air inlets for low volume, lightweight, and simple techniques for supplying and controlling liquid fuel flows for air breathing engines which operate in the Mach 5-10 regime. Earlier methods involving air-turbine driven pumping systems are complicated by the high enthalpy of engine bleed air, and new systems need to be proposed and evaluated.

N83-033 TITLE: Hypersonic Air Breathing Engine Inlet Conceptual Design and Analysis

CATEGORY: Exploratory Development

DESCRIPTION: (a) Innovative conceptual designs are needed for air inlets for air breathing engines which operate in the Mach 5-10 regime. Emphasis should be placed on high inlet efficiency, high air-capture, low drag and favorable operation at angel-of-attack. (b) Improved analytical techniques are needed in the computational fluid dynamics (CFD) area for calculating both external and internally ducted flow properties for hypersonic air inlets accounting for both in viscid and viscous effects. These techniques would be applied to the evaluation of potential performance of new innovative inlet designs.

N83-034 TITLE: Safe/Economical Processes for Rocket and Gun Propellant Manufacture

CATEGORY: Exploratory Development

DESCRIPTION: The use of highly energetic ingredients, such as the cyclic nitramines, RDX and HMS, are becoming increasingly necessary to meet the performance requirements of gun and rocket systems. Although these propellants are being processed in currently available facilities, the Navy desires to investigate alternate methods for their manufacture which would be less hazardous and more economical. Topic to be addressed would include the following:

(a) oxidizer preparation to achieve required particle size and particle size distribution

(b) fuel preparation and analyses

(c) propellant ingredient blending and mixing

(d) propellant curing

(e) continuous versus batch process

N83-035 TITLE: Thrust Vector Control Devices for 13.5-Inch Rocket Motor

CATEGORY: Advanced Development

DESCRIPTION: Develop a compact long duration Thrust Vector Control (TVC) device suitable for use in the Vertical Launch System (VLS). This VLS places limitations on the initial thrust levels of boosters but once of the launcher the TVC device must have the capability of rapidly turning the missile to the desired heading thus avoiding the waste of propulsion impulse.

A considerable amount of Research & Development Effort has been conducted and has provided improved movable nozzle TVC and jet vane TVC devices which provide good performance. Application of this technology to new missile systems requires survival for very long times with high performance propellants. High slew rates, omni axis capability and roll control are required.

N83-036 TITLE: Burning Rate Modifier for Nitramine Propellants

CATEGORY: Exploratory Development

DESCRIPTION: Develop materials that have a modifying effect on the ballistics of nitramine-containing propellants. Composite type propellants presently in use contain ammonium perchlorate which can be ground to various degrees of fineness to tailor the burning rate of the resulting propellant. Such grinding of nitramines has no effect on burning rate on catalyst and additives must be used.

The modifiers must be compatible with other ingredients in the propellant, have long term stability at extremes of temperature and be able to modify burning rate, pressure exponent, and temperature coefficient of nitramine-containing propellants.

N83-037 TITLE: Determination of High Temperature Strength of Rocket Motor Case Materials

CATEGORY: Exploratory Development

DESCRIPTION: Perform tensile tests on samples of rocket motor case materials (for example, 4130 and 7075-T6 aluminum) at temperature approaching the melting point to stimulate direct exposure to rocket exhaust gas. Determine yield and ultimate strengths as a function of temperature beyond the range published in MIL Handbook 5.

N83-038 TITLE: Thin Wall, Non-Ferrous Propellant Tube for Volume Limited Rocket Motor Applications

CATEGORY: Exploratory Development

DESCRIPTION: Develop and evaluate candidate materials as suitable propellant tubes to be used in cartridge loaded rocket motor applications. Thin wall materials allow higher performance to be incorporated into volume limited applications while maintaining reworkable hardware. Materials to be evaluated for bond strength, axial and longitudinal loads, impact, resistance, porosity, dimensional stability and heat resistance.

N83-039 TITLE: Cast-in-Place Nozzle Inhibitor for Flow Turning Applications

CATEGORY: Exploratory Development

DESCRIPTION: Develop and evaluate formable in-place nozzle inhibiting material(s) for rocket motor applications in which the thrust vector is not axial to the motor axis. Some rocket motor applications require turning the exhaust flow prior to expulsion from the nozzle. This application will develop materials to allow flow turning without nozzle/case damage.

N83-040 TITLE: Emission Strategies and Operations in Modern Naval Combat Systems

CATEGORY: Advanced Development

DESCRIPTION: An important factor in naval warfare is the use by an adversary of one's own signals (emissions) in both pre-battle intelligence and more immediate targeting and homing during the battle. To counter this use, it is not always appropriate, obviously, to cease operating one's own electromagnetic (and other) radiating equipment. Rather, with the very versatile and computer controlled systems now entering the fleet, more imaginative strategies for radar and radio use, based on total data-base inference and "gather data as needed" logic, are possible, strategies that include cover and deception as well.

Proposals are requested for a six-month study of such strategies, in context of the modern battle force. The early work would establish example systems and a reasonable scenario such that a description of such control strategies may be described and illustrated in the usual gain, loss and rise factors common to game theory. The effort will produce a report of less that 100 pages which describes results and proposes effort to follow of a more rigorous derivation of such strategies (with modeling to substantiate their worth) and algorithms upon which such strategies can be based.

Firms responding should have familiarity with naval surface warfare and systems and be skilled in classical stochastic analysis, which capabilities and a description of the general approach to best use of the short study time the proposal should make clear.

N83-041 TITLE: Tracking Algorithms – Exploitation of Total Inference Base In Surface Ships

CATEGORY: Advanced Development

DESCRIPTION: The work described here (a six month, one to two man effort) is in the area of multi-sensor target (aircraft generally) tracking. The Navy has made considerable advances in the last several years in the area of integrated tracing wherein several sensors (radars and ESM, for example) contribute individual data ("contacts") to a single track estimate. The purpose of this study is to expand this approach by 1) using still other data available in the earlier possible steps of track establishment (a priori information; information for communications with other similar ships; the often-discarded doppler information from one's own anti-clutter radar) and 2) taking advantage of control processes now available in computer-controlled systems, particularly in phased array radar. The effort will produce a report with preliminary but quantitative results, i.e., some algorithm based on dissimilar source data (contacts) in which bounds or weights are functions of other data (a priori; doppler info…) not normally used. The report will describe follow-on effort of one to two years' duration in which more rigorous modeling would be done and experiments performed.

Firms submitting proposals must have familiarity with exponential track filtering and association processes and the general Navy operational environment. The proposals must make this background clear, and provide a general scooping and scheduling strategy for best use of the six-month period.

N83-042 TITLE: Analysis of Peculiar Demands of Interior Communications in USN Surface Combatants

CATEGORY: Advanced Development

DESCRIPTION: The Navy has found it difficult to take advantage of the latest developments (particularly those in the commercial sphere) in communications technology in the interior communications systems aboard ships. The purpose of this six-month effort is to "marry" the Navy's particular needs in combat-system-associated interior communications with the latest of techniques and equipment resources coming from the general community. A rudimentary model of a Navy combat center will be derived, present methods understood for background; a survey of applicable modern techniques in, principally, voice, digitalized voice and some data communications shall be performed to lead to a description of a notional system, and, finally, a treatment of the necessary "militarization" of such a modernized system shall be included. The final effort of more thorough study and design and advanced development of an experimental and demonstrable sort.

Firms responding should have an understanding of naval interior communication systems and of combat operation, and of the field of communications and modern techniques. The proposal must make that background clear and establish a best use event sequence for the six-month period.

N83-043 TITLE: Application of Modern Materials to Critical System Components

CATEGORY: Engineering Development

DESCRIPTION: Cost, weight and durability of equipment remain matters of great concern to the Navy. Within the last decade advances have been made in lightweight strong materials (specifically in the graphite-epoxy and various metal-matrix types of materials) that may offer some relief in these areas. The purpose of this task is to identify particular components of deployed weapon and sensor systems, to describe the application thereto of appropriate new materials, to describe the nature of the component and its manufacture so constructed, and to appraise the relative benefit in the cost, weight and durability areas. It is expected that electromagnetic components (cabinets, unit assemblies) or mechanical apparatus (parts of launchers, loaders or handling equipment) would be typical of

components to be selected early in the effort. The effort shall produce a report which shall describe the five-to-ten components so studied as they might use the newer materials and the benefits of doing that; the report shall propose a one-to-two year effort to follow In which selected components would be developed in a demonstrable prototype form.

Firms proposing must have experience in military equipment in general, in the rigors of service use, in the technical performance of the components involved, and in the factory process involved in manufacture. The proposal must make these qualifications clear must make these qualifications clear and must exhibit a plan to use effectively the "six-month" period.

N83-044 TITLE: Reduction of Manning in USN Shipboard Combat System Operation

CATEGORY: Engineering Development

DESCRIPTION: The Navy has a desire to use its manpower as effectively as possible; considering particularly the high cost of supporting personnel on ships, a reduction in the number of operators necessary in combat system operation is most desirable. The purpose of this task is to present alternatives to the structure of operator roles and the balance between human and computer operations in the modern multi-mission combat system; liaison with the AEGIS project at the beginning of this effort is critical. The report must describe alternatives in battle organization or in the roles of individuals in the present organization(with concomitant changes in the nature in the automation involved) that have the potential of reducing personnel numbers or grades. The report of findings at the conclusion of this six-month effort must include some flow-charting and "scripting" of the operation in a modest multi-mission operation to illustrate the recommended alternatives and present a proposal for a one or two year follow-on effort to go into the computer programs and system modeling more detail.

Firms proposing should have experience in Navy combat system operations from an interior point of view and some human engineering and computer systems experience. The proposal should discuss that experience, present a plan for the best use of the six-month period and suggest the nature of the exhibit to be made in the final report of alternatives investigated.

N83-045 TITLE: Skirt Wear, Reduction of, Air Cushion Vehicles

CATEGORY: Advanced Development

DESCRIPTION:

1. Phase I of this task is to collect and analyze data to determine the feasibility of reducing air cushion vehicle skirt wear while operating over concrete ramps and pads. It is intended that precious experience with Air Cushion vehicle operations be fully utilized particularly operations in the United Kingdom (military and civil) and at the DTNSRDC Experimental Trials Unit in Panama City, Florida.

2. An output of Phase I will include a detailed test plan and procedure for testing skirt material. Actual testing and evaluation of the skirt wear reduction system will be performed in Phase 2 of this task. Samples of skirt materials to be tested will be provided.

3. This task is not related to a specific vehicle; however, some operational parameters, such as relative speeds, will be provided

N83-046 TITLE: Headspace Controlling Breech for Mann Test Barrels

CATEGORY: Exploratory Development

DESCRIPTION: The Majority of breech systems for small and intermediate caliber Mann barrels do not provide for headspace control in loading the fixed ammunition prior to firing. This failure to control headspace result in varying chamber volumes with concomitant variations in breech pressures.

The design and development of a reasonably priced Mann barrel breech would be of benefit in gun propellant R&D in that a variable condition can be controlled.

N83-047 TITLE: Design Methods for Ships Structural Response to Extreme Seaway Loadings

CATEGORY: Advanced Development

DESCRIPTION: The objective is to develop and analytical capability for predicting the structure responses of ships in a seaway, capable of application in the early phases of ship design. Until the advent of computer analysis, three-dimensional model tests in a sea keeping basin and full-scale trials in oblique seas were the only sources for data on ship structural response in a 3-D seaway. The time and cost required for such tests, however, make them impractical for direct application in the design process where the impact of a large number of ship parameters on structural response is desired. The continuing advances in computer technology, however, is now making possible the development of sophisticated, yet practical (from a time and cost viewpoint) computer codes for predicting the behavior of ship hulls operating in realistic seaways. Such codes are capable describing hull structural response due to wave action, slamming (both bow flare and bottom), as well as that due to other types of impact load. ROSAS 3 has been written to predict these structural responses. Under this task the 3-D version of ROSAS will be fully documented and verified with examples. An interface with the design program SHCP will be made, and documented, allowing the structural designer to dynamically calculate ship response to extreme wave loadings.

N83-048 TITLE: Ship Structural Details Using Angles and Channels

CATEGORY: Advanced Development

DESCRIPTION: the objective is to produce a Structural Detail Design Handbook for stiffeners of angle and channel cross-section. Structural detail design has been a blend of experience, science and art. Consequently, detail design is different in each shipyard. A military handbook is needed to standardize this design practice. This study will include: (a) collect structural detail data; (b) develop details screening process; (c) select appropriate details; (d) derive details design sizing algorithms; (e) conduct sensitivity studies; (f) prepare Detail Design handbook.

N83-049 TITLE: Extreme Seaway Loads Characterization for Ship Structures

CATEGORY: Exploratory Development

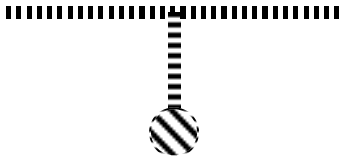
DESCRIPTION: Develop the half cycle ((HACYM) method of random data analysis as a means of identifying and characterizing extreme waves. Extreme wave data must be acquired and analyzed from Navy and commercial ship heavy weather damage information to identify critical loading problems. Correlate theses synoptic conditions with occurrences of extreme wave loadings. Characterize wave impact loadings, categorize these loadings, and establish design classes for structure subject to extreme seaway loadings. Navy ship structural design to withstand both local and overall hull girder loadings is generally empirical in nature and does not result from a rational definition of extreme seaway loadings. As a result, assurance of structural integrity in extreme seaways is implicit rather than explicit under the current state-of-the-art. This task is intended to provide those technology developments which will lead to explicit assurances of adequate structural integrity. This will result in improved safety during severe storms and in improved combat readiness after such storms compared to that which can be offered by current design criteria. It will also help to preclude “Class Problems” which have occurred in the past.

N83-050 TITLE: New-Longitudinal Stiffener Configuration

CATEGORY: Exploratory Development

DESCRIPTION: the objective of this proposal is to save ship construction time and cost through simplification of the structural configuration of longitudinal structural members. In portions of ship structure, the flange of a conventional "T" shaped stiffener, can result in difficult fit-up and access for welding. Concentration of this flange greatly improves the welding access and results easier collar installation.

This proposal recommends investigation of the potential steel mill fabrication cost of the special mini-flange TEE and the shipyard savings to be realized by the use of a mini-flange "T" for longitudinal ship structures. The special mini-flange "T" could look in a section like the symmetrical bulb stiffener.



The concept would have great acceptance by shipyards for both steel and aluminum ship structures:

The study shall include:

A. Literature Search
B. Configuration Screening
C. Analysis Tradeoffs
D. Steel Mill Shipyard Inputs
E. Final Report w/ recommendations

N83-051 TITLE: High-Current Circuit Breakers for Naval Shipboard Electric Power Systems

CATEGORY: Advanced Development

DESCRIPTION: Develop and analyze novel design concepts for circuit breakers with interrupting capacity of 200,000 amps for use in 450 volt, 650 Hz electric power distribution systems in Naval Ships.

N83-052 TITLE: Low-Harmonic 400 Hz Line Voltage Regulator for Shipboard Power Systems

CATEGORY: Advanced Development

DESCRIPTION: Develop and analyze new design concepts for line voltage regulator for 400Hz shipboard electric power systems which are capable of accepting non-linear input without causing harmonics on the power source.

N83-053 TITLE: Reversing Gas Turbine

CATEGORY: Advance Development

DESCRIPTION:

1. Using advanced technology, the contractor will determine what must be developed and the extent of changes that will be necessary to modify existing gas turbines for direct reversing in the power turbine.

2. The contractor will determine benefits and disadvantages to the Navy with particular emphasis on new ship construction and follow-up operation.

N83-054 TITLE: Non-Magnetic Cast Iron Diesel Engine

CATEGORY: Exploratory Development

DESCRIPTION: The contractor will determine methods that might be employed to economically and with high yield, produce modular cast iron engine blocks for small and medium size Diesel engines.

N83-055 TITLE: Advanced Shafting Technology

CATEGORY: Exploratory Development

DESCRIPTION: The contractor will examine techniques that may be employed to produce low RPM, high torque shafting for Navy ships, subs, and boats. Adaptation of advanced materials (composites, etc.) and manufacturing techniques will be considered.

N83-056 TITLE: Heat Pipe Application to Gas Turbines

CATEGORY: Exploratory Development

DESCRIPTION: The contractor will investigate possible areas and methods of application of heat pope technology to gas turbines. The purpose will be to improve the efficiency of the basic, simple cycle engine. Simplicity, reliability, and cost effectiveness will also be considered.

N83-057 TITLE: Market Survey of Developers of Antennas for Portable Ground Telemetry

CATEGORY: Engineering Development

DESCRIPTION: A technology survey of antennas, antenna development, and related research activities having application to performance requirements of AN/SKQ-9 &-10 telemetry system antennas. The SKQ-9 and –10 are mainstay portable shipboard UHF receiving systems for performance data telemetered from in-flight STANDARD Missiles. Each system contains one portable, High-Gain antenna containing narrow and wide beam automatic changeover features that are mounted on an autotracking pedestal.

N83-058 TITLE: Missile Test Equipment, Low Cost & Simple Maintenance

CATEGORY: Advanced Development

DESCRIPTION: Present automatic test equipment for guided missiles is extremely costly ($4 million) and requires a graduate engineer to maintain it. There is a need to make a concerted examination of integrated circuit and microprocessor technology to missile RF guidance test set requirements. This task shall be to survey and compare the capabilities of current military missile test equipment and their current designs including microprocessor applications. A development plan for comparison of low cost applications by breadboard and critical parameters using current military or suitable commercially available integrated circuit and microprocessor techniques should result.

N83-059 TITLE: Design Concepts for Conventional Warheads for Anti-Air Guided Missiles

CATEGORY: Advanced Development

DESCRIPTION: Increased lethality of conventional anti-air missile warheads is required. The targets are hard, fast, anti-ship missiles and require a fast kill. Very high fragment velocity is required, as is airgame structural load-bearing capability. Desired are: simple case design, ease of manufacture, and a case unit cost below $400. Warhead weights: 50-to-200 pounds, fragment weights: 50-to-1000 grams.

N83-060 TITLE: Effect of Surfactants on Fluid Flow

CATEGORY: Exploratory Development

DESCRIPTION: Recent flow experiments have shown that surfactants when added to water can dramatically change the flow characteristics. The reasons for these changes have not been proven. Different surfactants have produced different flow results.

The purpose of this program is to investigate the surface chemistry effects of surfactants, and water, produce in the laboratory carious types of surfactants and characterize their effect on the flow parameters over different surfaces. The contractor should possess knowledge of surfactants, their effect on surface chemistry and be able to produce small quantities for testing in hydrodynamic facilities. The contractor must also be able to neutralize the surfactant's effects so as not to contaminate the test facilities.

N83-061 TITLE: Tracking Function For AN/SQS-26CX Broadband Passive Sonar Subsystem

CATEGORY: Engineering Development

DESCRIPTION:

1. Perform study to determine cost-effectiveness of adding a target tracking function to the broadband passive subsystem of the AN/SQS-26 Sonar. Determine optimum passive bearing accuracy for ASW mission o FF 1052 Class ship.

2. Provide report describing details of study conducted and recommendations regarding implementation, if considered cost-effective.

N83-062 TITLE: Target Simulator for Surface Ship Passive Sonar Subsystem

CATEGORY: Engineering Development

DECRIPTION:

1. Determine most cost-effective method for providing a passive acoustic target simulator for surface ship passive sonars. Simulator shall be embedded in existing sonar system, and shall be capable of providing for passive performance monitoring and shipboard training. Simulator shall be capable of generating a minimum of four (4) acoustic lines.

2. Submit report detailing studies conducted and recommendations for implementation.

N83-063 TITLE: Measurement of Surface Ship Sonar Self-Noise

CATEGORY: Engineering Development

DESCRIPTION:

1. Conduct complete review of techniques used to measure surface ship sonar self-noise. Determine relative accuracy of the various techniques.

2. Based on present state-of-the-art, determine what new techniques could be used to measure surface ship sonar self-noise. Determine relative accuracy of these new techniques.

3. Provide recommendations with backup rationale for a method of measuring surface ship sonar self-noise to obtain maximum accuracy with greatest ease of operation. Trade-offs based on cost-effectiveness shall be included.

4. Submit report describing the effort expended and results obtained under Item 1,2 and 3 above

N83-064 TITLE: ALOFTS Test and Evaluation Analysis

CATEGORY: Engineering Development

DESCRIPTION: Demonstration of an Interim Action Low Frequency Towed Sonar (ALOFTS). ALOFTS is a low frequency (1KC), below layer active sonar to be installed in Variable Depth Sonar (VDS) using the SQR-18 tow array as the receiver.

Tasks include: (1) Review contractor proposal, design, T&E plan; (2) Verify performance predictions, compare validity of other system capabilities; (3) Monitor transducer lake tests, subsystem and system facility tests; (4) After the U.S. Navy performs ship installation and test and evaluation, conduct system analysis trade-offs and assess application of ALOFTS concept for other ship classes and systems.

N83-065 TITLE: In-Water Calibration of Surface Ship Sonars

CATEGORY: Engineering Development

DESCRIPTION: Develop and approach by which a known source level (e.g., AN/WQM-6) in measured environmental conditions may be used to conduct a quick (one day) evaluation of ship self-noise and recognition differential figures, permitting identification of problems or confirmation of sonar status.

N83-066 TITLE: Gearless, Direct Drive, Inertia Sustained Power Unit

CATEGORY: Advanced Development

DESCRIPTION: Design and construct a one-quarter-scale model of a gearless, direct drive, inertia sustained power unit for proof of concept verification. The design should be such that, with minimum modification, a full-scale prototype could later be constructed as a power drive for Navy positioning systems in gun mounts, weapon launchers, radar antennae, or other applications. This power drive unit would replace current bulk, noisy, expensive geared power transmission units of limited growth capacity requiring frequent maintenance. Application for patent has been made on the concept which would provide quiet, backlash free, reliable, infinitely variable speed controlled, forward or reverse operation and which would be sustained on significantly lower input power from a prime mover. This concept is also presently being analyzed under an Individual Research project at NUSC.

N83-067 TITLE: Redesign ASROC Launcher MK 112 Missile Restraint Mechanism

CATEGORY: Engineering Development

DESCRIPTION: The existing Restraint Mechanisms were never designed as a dynamic stop. Missiles were initially "jogged" into position and latched into place. Now, with power-driven missile loading systems aboard ships, the existing design does not permit sufficient time to catch the missile lug properly nor can the existing design be redesigned to do so. This project requires innovative design which will provide all of the features required of a restraint mechanism when used in conjunction with power driven loading systems.

N83-068 TITLE: Lubrication Study Relative to ASROC Launcher MK 112

CATEGORY: Engineering Development

DESCRIPTION: Perform analytical study of lubricants and methods of application and retention, small scale modeling and testing. Study will provide basis for the redesign/improvement of missile launch systems. Providing state-of-the-art lubricant and methods for reduction/elimination of ship's force lubrication between major overhauls and elimination of lubrication related equipment between major overhauls and elimination of lubrication related equipment failure.

N83-069 TITLE: Develop Three Dimensional Finite Element Mesh of SVTT MK 32

CATEGORY: Engineering Development

DESCRIPTION: Develop a three dimensional finite element mesh of Surface Vessel Torpedo Tube MK 32 Rotating Base. Data file to be compatible with ABAQUS and verified using dynamic loading inputs from existing empirical test data. This effort will be included in a full model of the launcher training assembly. The full model will assist in developing and evaluating the feasibility and practicability of proposed solutions in analyzing potential problem areas resulting from increased launcher weight due to armament, ALWT, and new quadritube launcher.

N83-070 TITLE: High Speed Surface Ship Torpedo Launch Dynamics Computer Model

CATEGORY: Advanced Development

DESCRIPTION: In view of projected surface platform advancements, in terms of speed and maneuverability, and hydrodynamic concerns of advanced torpedo configurations is becoming increasingly important. Under NUSC Independent Exploratory Development Project A42120, a pneumatic launch computer simulation model was developed and subsequently modified to generate exit velocity and static platform trajectory data for various launcher and torpedo configurations. Extension for this model for evaluation of dynamic platform characteristics is proposed. This would include analysis of aerodynamic effects on torpedo trajectory and hydrodynamic effects, through water entry. The expanded computer model generated by this analysis would allow prediction of water dynamics for launching advanced torpedo configurations from high speed surface platforms and would e capable of generating data suitable for expanded hydro ballistic studies of water entry phenomena particular to the velocities, angles of attack and initial trajectory instabilities representative of a typical surface launched torpedo delivery.

N83-071 TITLE: Composite Material Design for ASROC Launcher MK 112

CATEGORY: Engineering Development

DESCRIPTION: The MK 112 Launcher Mods 1-8 as well as the EX114 new guide had experienced and will experience corrosion and weight problems. Many of these problems can be rectified be fabricating many of the launcher components from high strength, light weight, corrosion resistant composite materials. Research is required into the carious composite materials and their properties, and a design study must be performed to determine what components can be manufactured from what materials.

N83-072 TITLE: Diver Hand Held Underwater Positioning System

CATEGORY: Advanced Development

DESCRIPTION: Concepts and ideas are solicited for a system that will enable drivers to swim programmed paths or require specific positions in water depths to 200 feet. The system must be small enough to be deployed from small inflatable rubber boats by a three man team and operated by a single diver. It must also provide a capability for a diver to designate specific points along the programmed tracks to which he may wish to return.

All units be self-contained and require a minimum of training and maintenance.

N83-073 TITLE: Low Magnetic Signature, Low Power Consumption Sensor for Detecting Deeply Buried Ferrous Ordinance

CATEGORY: Exploratory Development

DESCRIPTION: Concepts and ideas are solicited for a sensor system capable of detecting deeply buried ordinance. The system must have a very low power consumption so that it can be configured for man portable use on the surface or underwater to depths of 300 feet. It must also present a very low magnetic signature so that it can be used in multiple sensor towed configuration without presenting a target to adjacent sensors.

If possible, the sensor should be capable of providing information about the ordinance item including size and burial depth.

N83-074 TITLE: Automatic Data Processing System for Side Scan Sonar and Magnetometer Data

CATEGORY: Advanced Development

DESCRIPTION: Concept and ideas are solicited for an automatic data processing system for analyzing side scan sonar and magnetometer data. The data is generated during underwater or surface applications and stored on magnetic tape or other applicable storage medium.

The system must be capable of programming to identify specific items of varying size, shape, or signature from the storage data. It must also be capable of interfacing with other data such as positioning or navigation data and producing output plots of specific item location in a searched area. Output in printed form listing item description (signature) and position.

N83-075 TITLE: Nuclear Attack Submarine Integrated Communications Systems (ICS)

CATEGORY: Engineering Development

DESCRIPTION: A Data link Communications System (DLCS) is being developed to provide over-the-horizon target detection, classification and targeting data for submarines equipped with the TOMAHAWK cruise missile. The DLCS effort will require development of R&D hardware to support technical and operational evaluation plus modifications to meet anticipated changes in communications networks. Additionally, ICS work will entail development of specifications for a high data rate bus architecture.

Technical Disciplines Required: DLCS is in the production Phase Minor system components such as switches SB-3916, SB-3918, and SB-3959 and a frequency standard transfer could be purchased by small business. Small business could support operational testing and training (curriculum preparation and development).

ICS (bus architecture phase) is in the concept exploration phase. Potential for work exists in specification preparation, technology assessment, modeling, simulation, human factors engineering and preparation of technical/cost benefit analyses.

N83-076 TITLE: Applications for "Personal Computers" within NAVELIX

CATEGORY: Engineering Development

DESCRIPTION: This project consists of improving the design and frequency response of vertical submarine communications mast antenna systems, development of improved buoyant cable antenna handling mechanisms and development of both a new expendable and a new towed buoy communications antenna.

Technical Disciplines Required: ELF,VLF, HF and UHF spectrum antenna concepts, design and application in underwater environment; hydrodynamics; electro-hydraulic winch drive systems and fiber optic transmission lines.

N83-077 TITLE: Applications for "Personal Computers" within NAVLEX

CATEGORY: Advanced Development

DESCRIPTION: Characterization of engineering, clerical and record keeping functions within NAVELEX. Estimation of efficiency increases in "throughput", decreases in cost or time and space savings, if any, resulting from the introduction of "Personal Computers" to the Command. Documents thresholds and assumptions which if changed would influence the conclusion (i.e., cost of individual terminals, cost of memory, etc.)

N83-078 TITLE: Basic Research in Electronics

CATEGORY: Research

DESCRIPTION: Focused basic research studies in electronics are of interest to NAVELEX in the areas of electronic materials development and fundamental device studies with emphasis on novel approaches to achieve goals of Navy interest – e.g., improved radiation hardness.

N83-079 TITLE: Basic Research in Mathematics

CATEGORY: Research

DESCRIPTION: Focused basic research studies in mathematics are no interest to NAVELEX in the areas of command and control theory, communications theory, electronic component and system reliability analysis techniques, and mathematics theory that relates to undersea acoustics and surveillance.

N83-080 TITLE: Basic Research in NAVELEX Applications

CATEGORY: Research

DESCRIPTION: Basic research studies that are focused on a single aspect of a complex NAVELEX system are of interest. Areas of interest could include Electronic Warfare (EW) technology, communication systems, and satellite devices. Example type projects are, for instance, ones addressing new materials that have an EW benefit, a new antenna concept or a paper concept analysis of a new satellite.

N83-081 TITLE: Innovative Architectural Approaches to C^3 Data Processing

CATEGORY: Exploratory Development

DESCRIPTION: Innovative architectural approaches to C^3. Techniques should be robust enough to deal with imprecise information and rapid interactions.

N83-082 TITLE: Innovative Architectural Approaches to C^3 Networking

CATEGORY: Exploratory Development

DESCRIPTION: Innovative approaches to C^3. Techniques should adequately address technical problems associated with internetworking of heterogeneous networks and measurements of performance.

N83-083 TITLE: Synthetic Aperture Radar Detection High Speed Targets

CATEGORY: Research

DESCRIPTION: Synthetic aperture radar detection of high speed targets. Techniques should adequately address technical problems associated with signal processing and target classification.

N83-084 TITLE: Acoustic Communications

CATEGORY: Exploratory Development

DESCRIPTION: Acoustic communications techniques will provide communications to submerged submarines. New acoustic communications concepts will be pursued commencing in FY 84.

The effort will address operational concepts and technologies, including propagation characterization, acoustic relay tactics and technology and carrying depth sonobuoy transmitter concepts.

N83-085 TITLE: Low Power HF Surface Wave Communications

CATEGORY: Exploratory Development

DESCRIPTION: Low power (less than 1W) HF communications is required with a minimum data rate of 1,00 bits per second over ranges of 300 to 500 nautical miles. The transmitting antenna must be suitable for relatively small oceanographic buoys not exceeding 6' in height and 18''in diameter. The receiving antenna and radio must be portable and suitable for operation on a ship or vehicle hoisted on the beach. The data rate and ranges indicated must be achievable year round over open ocean conditions through a diurnal cycle. Hardware demonstration is desired to show performance at some site to be selected along the east coast. Support studies will project performance for different reasons and locations.

N83-086 TITLE: Millimeter Wave Technology

CATEGORY: Exploratory Development

DESCRIPTION: Conduct a millimeter wave systems survey to identify R&D needs, critical problems and potential Navy systems applications for active millimeter wave devices such as field effect transistors, IMPATT devices, transferred electron devices, monolithic circuits, mixer diodes, and receiver protection devices. Survey results will be used to define a millimeter wave solid state service development program.

N83-087 TITLE: Ocean Surveillance Research

CATEGORY: Exploratory Development

DESCRIPTION: A continuing technology program to improve the Navy's production and use of information from all surveillance sources. Research requires advances in mathematics and computer science for multiple source correlation, resource allocation and analysis techniques.

N83-088 TITLE: Optical/UV/IR Communications

CATEGORY: Exploratory Development

DESCRIPTION: This project addresses Navy-unique system engineering and technology issues in the development of communication systems for submerged submarines using blue-green lasers in conjunction with advanced narrowband optical filters. Test areas include the design of affordable receivers and lasers, aircraft laser configurability assessments and communications system engineering. Aerospace laser transmitter technology will be investigated in FY 84.

N83-089 TITLE: Power Supply Design Techniques for VHSIC 1.25 um and 0.5 um Technologies

CATEGORY: Exploratory Development

DESCRIPTION: The new semiconductor technologies being developed under the VHSIC program are driving the power supply voltage requirement down to the 1.5 to 3.0 voltage range from 5.0 volts. This will require the development of new power supply designs which have high efficiencies in the order of 80 to 90%. This high efficiency will be required to scale down the size and weigh of the power supplies to a point where they would be compatible with the size and weight reduction gains of VHSIC. A reduction in power supply size and weight of a factor of ½ to ¼ will be required.

N83-090 TITLE: RF Communications

CATEGORY: Exploratory Development

DESCRIPTION: The objective of this project is to increase the speed, versatility, and survivability of voice and data transmission systems to meet the needs or real-time command and control of Naval Forces. This effort will investigate promising technologies and system concepts that have the potential to provide cost-effective enhancements to existing and planned communications systems. The comprehensive technical thrusts include:

- Networking
- ECCM Techniques
- Submarine Communications
- EHF SATCOM

N83-091 TITLE: Satellite Countermeasures and Defense Program

CATEGORY: Exploratory Development

DESCRIPTION: An exploratory development program emphasizing techniques for hardening U.S. satellites against Soviet physical and electronic countermeasures while at the same time exploring vulnerabilities of hostile satellite systems in the same areas.

N83-092 TITLE: Ships Electronic Warfare

CATEGORY: Exploratory Development

DESCRIPTION: Develop a broad technology base for missile and command/control/communications countermeasures. Areas of development include:

(1) Countermeasure techniques
(2) RF/IR/WO/TV single and multi-mode sensors guidance simulators and digital models.
(3) IR/RF/EO absorbent and emissive materials
(4) Decoy and other off board EW devices

N83-093 TITLE: Telecommunications Exploratory Development

CATEGORY: Exploratory Development

DESCRIPTION: The Communications Exploratory Development Program includes the investigation of critical technologies and system concepts which offer potential for significant, timely, and cost-effective contribution to Navy operational effectiveness. These efforts address Navy-unique requirements foe secure, reliable and survivable communications on a variety of operational platforms (i.e., airborne, surface, and subsurface).

N83-094 TITLE: Increase the Bandwidth of the Band 9ALQ-99 TWT

CATEGORY: Advanced Development

DESCRIPTION: Develop a Helix band 9 Traveling Wave Tube (TWT) to replace 1/3 octave high cost coupled cavity TWT

N83-095 TITLE: Digital Safe and Arm Device for Guided Missile

CATEGORY: Advanced Development

DESCRIPTION: The current horological safe and arm devices reflect the need for a craft that is a dying art and has been one source of many production problems. The required innovation is a digital electronic device to time the launch and arm sequence of guided missiles and perform the safe and arm functions electrically as opposed to mechanically. The concept is that a good electronic design is more forgiving of low manufacturing skills than are watchwork components.

N83-096 TITLE: Conventional Munition Guidance Stable Element

CATEGORY: Advanced Development

DESCRIPTION: The most cost and technology intensive device which militates against low cost guidance for conventional weapons/bombs is the stable element. The desired innovation is a frame of reference device which provides a stored memory in the guidance unit and emits initial commands to include up, down and port and starboard directions without restricting maneuvers of the delivery aircraft.

N83-097 TITLE: Technology Assessment/Evaluation Methodology

CATEGORY: Advanced Development

DESCRIPTION: The utilization of the most appropriate technology is the best means of keeping Naval Aviation ahead of all potential adversaries. The desired methodology would provide a means of assessing and evaluating those technologies which best meet NAVAIR needs. The methodology should allow identification of the best methods of categorizing, prioritizing and allocating of resources to the most promising technologies. Also included should be: the development of a means of recognizing viable and mature technologies and ways to recognize the technologies which need resource allocations to develop into mature and useful technologies.

N83-098 TITLE: Biologically Produced Macro-molecules for Aviation Materials

CATEGORY: Exploratory Development

DESCRIPTION: Recent advances in genetic engineering promise an almost unlimited library of micro-molecules. It is expected that lubricants, adhesives, plastics, emulsifiers, cleaners, corrosion control chemicals and the like are potential end products of the science of genetics.

The purpose of this program is to obtain relevant research and development on predicting the properties of a wide range of macro-molecules having potentially useful material enhancement properties. The R&D is expected to create an understanding of the opportunities and limitations in the building of macro-molecules using biological processes.

N83-099 TITLE: Non-Destructive Testing and Inspection Techniques

CATEGORY: Advanced Development

DESCRIPTION: Recent scientific development in the area of ultrasonics internal friction damping, eddy current changes, X-ray line broadening are very useful. It is desired to develop innovative non-destructive testing to determine fatigue damage prior to cracking and/or residual stresses I critical aircraft parts. Another area of interest is the application of innovative ultrasonic measuring techniques to determine the location and size of defects in advanced composites.

N83-100 TITLE: Innovative Coating Research

CATEGORY: Exploratory Development

DESCRIPTION: New methods to incorporate novel coating to investigate:

(1) corrosion inhibitors to enable enhances corrosion resistance including arrestment of stress and fatigue corrosion.
(2) The chemical composition, microstructure and electrochemical properties to determine the important characteristics of a coating such as adhesion and corrosion protection.
(3) the incorporation of certain pigments into coating systems to reduce Radar cross section and/or reflectance in the infrared & laser spectrum.

N83-101 TITLE: Biochemical and/or Molecular Engineering\

CATEGORY: Exploratory Development

DESCRIPTION: Perform innovative research using new techniques involving biochemical and/or molecular engineering to produce unique materials for naval air application i.e. new adhesives, coating, polymeric materials.

N83-102 TITLE: Landing gear Load Monitoring System

CATEGORY: Engineering development

DESCRIPTION: Develop a simple, inexpensive system for measuring and recording loads introduced through Landing Gear on Navy aircraft. System should be capable of measuring bending, tension and axial forces on aircraft nose and main gear structural components.

N83-103 TITLE: Repair of Laminated Composites Using Ultrasonic Method

CATEGORY: Advanced Development

DESCRIPTION: Classical approaches of repairing laminated composites by resin injection have not been consistently successful because the resin cannot flow into the narrow separation between plies. Innovation is desired in the application of ultrasonics to reduce the surface tension or resins and thereby enhance the flow. A study should be conducted to determine the parameters needed to enhance resin flow into delaminated composites. The method will be validated by repairing Navy supplied panels which will be inspected and tested statically and in fatigue.

N83-104 TITLE: Synthesis of High Density Adamantane Monomers

CATEGORY: Exploratory Development

DESCRIPTION: The incorporation of adamantine structures into polymers is reported to increase stability and radiation resistance. New low cost methods of preparation would provide for application in volume limited missile systems as fuels, explosives or propellants.

N83-105 TITLE: Aerosol Measurements Using Instrumented Aircraft

CATEGORY: Exploratory Development

DESCRIPTION: Extinction of laser radiation is of interest in optical countermeasures against laser-guided systems. The particle size of the aerosols enters into the extinction effect. The determination of size distribution under various atmospheric conditions can be determined with instrumented aircraft designed for the purpose. It is desired to develop innovative instrumentation to determine the size distribution of aerosol particles.

N83-106 TITLE: Environmental Satellite Development

DESCRIPTION: Investigate innovative and inexpensive concepts for supplementary Major Satellite Systems with a support system. Design sensor, satellite and data processing equipment to generate environmental data in support of Numerical Models.

N83-107 TITLE: Shipboard Relative Humidity & Slant Range Visibility Sensor Concepts

CATEGORY: Exploratory Development

DESCRIPTION: This task calls for a conceptual design of a relative humidity sensor and a slant range visibility sensor. Since the sensor are intended for shipboard operational use by Navy enlisted personnel, careful consideration shall be given to cost, reliability, maintainability, built-in-test (BIT) and ruggedness.

N83-108 TITLE: Theory Applicable for Antennas Buried in Sea Water

CATEGORY: Exploratory Development

DESCRIPTION: Current theories are inadequate to predict radiation efficiency of such antennas for low frequency transmission from buoys of submarines. The research significance of this effort is that the use of an antenna imbedded in sea water vastly reduces the length requirement.

N83-109 TITLE: Air Vehicle Warning Using Bistatic Radar Sonobuoys

CATEGORY: Advanced Development

DESCRIPTION: There is a great need for new methods of low altitude attack warning when aircraft radars are not available or are not effective. Innovative development to use sonobuoys, which are configured as a bistatic radar fence are needed. The development must address the following issues:

- Optimum deployment configurations and performance estimates
- Sonobuoy transmitter spectral purity measurements
- Bistatic processor configuration, with direct path excision
- Wave masking effects from transmitter-to-target
- Multipath effects
- ECM response threat evaluation

N83-110 TITLE: SIGINT Sensor For Shiplaunched TITLE RPV's

CATEGORY: Exploratory Development

DESCRIPTION: This low cost communications signal intercept, jamming, and decoy package would be deployed in shiplaunched remotely piloted vehicles (RPV's) to extend the communications ESM/ECM and ASW capabilities of the ship past the normal line of sight horizon. The remotely programmable intercept receiver, signal analyzer and transmitter electronics would exhibit sufficient sophistication to intercept unfriendly communications, identify them, and generate interfering emissions before vital reconnaissance and targeting information could be communicated to other attack forces. The occurrence of these events would simultaneously be transmitted back to the ship by the RPV communications link providing early warning and approximate direction of an approaching attack force. The electronics would also contain the ability to emulate and transmit friendly communications signals sequenced according to typical operational scenarios. This feature would provide the capability to use the RPV in a decoy/deception mode of operation with location and timing control unavailable with other resources such as buoys. The electronics package would be less than 550 cubic inches in volume, less than 8lb. In weight, and consume less than 25 watts average power when operated in the jamming and deception modes.

The work would consist of making a preliminary concept design of the SIGINT SENSOR/jam/decoy package.

N83-111 TITLE: Long Haul HF Command/Data Link for Buoys

CATEGORY: Exploratory Development

DESCRIPTION: This low cost HF link for remote buoys would provide a command/data/ link between a central control station and multiple sensors comprising a field over an area of radius up to 1500 nautical miles. It would provide an attractive alternative to satellite links used for this purpose with the advantage that the survivability would be much higher than satellites during time of war. Also, the combined use of narrowband signaling low transmit duty cycle, time diversity and low data rates would enable the data to be communicated with less peak power than normally required for satellite links. The links would also provide near real time data reporting to the

central control station which is often not possible with satellite links. The HF buoy link equipment would be less than 400 cubic inches in volume, less than 5 pounds in weight, and consume less than .2 watts average power.

During the first year work would be undertaken to make preliminary conceptual design of a HF system. Subsequent efforts would be: (1) to demonstrate over land a narrow band HF system using off-the shelf equipment and (2) at sea demonstration employing HF buoy link electronics.

N83-112 TITLE: On-The-Bottom Surveillance Buoy

CATEGORY: Exploratory Development

DESCRIPTION: An Air ASW sensor contained in an "A" size sonobuoy package that sinks to the bottom of the ocean floor can provide a long life Air ASW surveillance capability. This may be done by combining the long detection ranges achievable by on-the-bottom sensors employing the Reliable Acoustic Path (RAP) with sophisticated, programmable, low power consumption and very small in-buoy acoustic processors that extract submarine acoustic radiations and provide contact reports. This compressed data could be transmitted to the surface by burst acoustic communications on a programmed schedule that meets patrol aircraft readout aircraft may be used to relay the contact report(s) to the readout aircraft. Acoustic data transmissions avoids the complexity and high cost of an electromechanical link to the surface. This concept has a large force multiplier effect because it permits coverage of much larger ocean area in a given amount of time.

The proposal effort would be to make a preliminary conceptual design of a compresses data burst acoustic communications link. Subsequent efforts would be:

(1) Conceptual design of bottom-positioned acoustic buoy with in-buoy acoustic processors undertaken in second year of program and (2) Fabrication of demo unit for lab test unit(s) for test during fourth year of project.

N83-113 TITLE: Multiple Dimensional Ship Imagery

CATEGORY: Research

DESCRIPTION: The use of imaging sensors from aircraft and weapons to classify ship targets requires the near real-time multiple dimensional correlation of sensor image features with physical features of sip targets. Real environments of multiple contacts and multiple sensors create an information management burden on operators to simultaneously direct sensors, sort images for quality, synthesize images from combinations of range only, 2-D and 3-D sensors. Research and technology development is required on algorithms for computer aided (on aircraft) and fully automated (in weapons) processing of image data. Needed are: measures of image quality based on 3-D statistical correlations of features; inferential procedures for partially occluded features; techniques for curved object segmentation using local edge interpretations; image synthesis criteria and rules; and hierarchical structures for classification hypothesis that contain numeric and non-numeric information necessary to sort and track multiple contacts. The long-range targeting and terminal guidance phases of engagements present different problems.

Expert systems approaches for classification decisions and production rule methods for image sorting, synthesis and hypothesis pruning are research areas of artificial intelligence that are appropriate for investigation.

N83-114 TITLE: Analytical Decision Making Software

CATEGORY: Engineering Development

DESCRIPTION: Develop software, useable on a minicomputer system in Basic, capable of analyzing general project cost, quantity and delivery schedules against selected criteria and normalized historical data base. Further, the software will be interactive to allow statistical manipulation of the data using call up program.

N83-115 TITLE: Ocean Instrumentation

CATEGORY: Research

DESCRIPTION: Proposals are being solicited on support of new development in ocean instrumentation. Emphasis will be on work relating to devices which measure physical quantities both in situ and remotely. Such quantities include, but are not limited to, ocean surface height, water temperature, salinity and current, pressure, color, optical transmissivity, air/sea fluxes of heat/water vapor momentum. In addition, new navigational techniques which enhance such measurements are also included.

Emphasis will be on device production where a complete system is proposed. Priority is given to techniques involving simple deployment and include aircraft/satellite, ship, free drifting, free fall, and moored configurations.

Proposals may involve the improvement of existing techniques as well as component improvement. Utility to the basic research community is given high priority.

N83-116 TITLE: Development and Exploitation of New Acoustic Measurement Techniques

CATEGORY: Research

DESCRIPTION: The Navy needs sophisticated sensing techniques and materials with specific properties including reliability. More accurate, reliable, and versatile acoustic techniques for sensing and measuring parameters of interest to the Navy will provide options and improvements in instruments for sensing operational parameters and for characterization and reliability assurance of Naval materials. There had been in recent years a trend toward renewed interest in exploiting the power of acoustic measurement techniques, especially those that ate only now possible with our rapid advances in other technologies and in computing power. There is a need foe basic research that will develop innovations in acoustic methods for measurement of parameters of instrumentation. Acoustic techniques, both new and old (especially when implemented with stat-of-the-art instrumentation and computer support) are capable of achieving results previously not practically attainable. Acoustics often offers unique solutions to problems. The interests ate to conceive and demonstrate proof-of-principal for innovations on acoustic measurement methods and to implement some of them in ways that will find applications. These range from the experimental validation of existing theoretical results to the putting together of several proven techniques heretofore no used in combination. The applications include nondestructive evaluation, transducer calibration and characterization, materials research, measurement of radiated noise and other sound fields, and sensing of environmental parameters.

N83-117 TITLE: Acoustic Detection of Remote, Low Altitude Nuclear Burst at Sea

CATEGORY: Advanced Development

DESCRIPTION: Over the past two years the theoretical base has been developed for using long path underwater acoustic signals to detect low altitude nuclear bursts at sea. This research has reached a state where it should enter the development cycle and be reduced to practice.

Initial effort would be the development of algorithms and software for determination of location, yield and height of burst. Once developed the accuracy can be verified using existing acoustic data from previous nuclear tests at sea.

Further development would be required to obtain and set up proper monitoring equipment at underwater listening stations and to establish a single center for analysis of data from all stations. A likely choice for the analysis center would be the Naval Ocean research and Development Activity (NORDA)

N83-118 TITLE: Remote Sensing of the Atmosphere Profiles foe Variable Constituents and Properties

CATEGORY: Research

DESCRIPTION: Proposals are being invited in both observational and theoretical approaches to geophysical problems and phenomena. Techniques and ideas are sought for the sensing of variable constituents such as water vapor, ozone, nitrogen oxides, particulate matter (including number and size of hydrometers) ion content and for physical properties such as temperature, refractive index, wind velocity and shear. Type of remote sensing interest includes radar (including millimeter) laser, infrared and acoustic. Passive techniques are of special interest. Proposals submitted should also hive consideration to rapid processing and readout and effective display of data.

N83-119 TITLE: Automating the Process of Developing and Maintaining Computer Software

CATEGORY: Research

DESCRIPTION: The process of developing and maintaining Computer Software is very costly, moreover it utilizes scarce manpower resources. The cost of software comes both before it is released to the fleet, due to design and testing, and for many years after release when it must be modified to meet changing requirements and conditions. Both activities are manpower intensive. The promise for alleviating this problem lies in automating as much of the software process as possible, particularly focusing on those areas which are labor intensive. There exist now a quantum jump in the automation of the software process. Specific research areas include:

- Very high level languages and systems which can automatically translate specifications into tested, verified, efficient code;
- Automating the routine, editorial tasks a programmer does and which detract from the important work of conceptualizing and designing;
- Use of artificial intelligence techniques for automated programming debugging, documentation and maintenance; as aids in conceptualizing and designing software; and to aid in the management of software;
- Technologies, such as program visualization, to aid the automation process, and to be utilized in all phases of software from requirements to maintenance.
- Evolution of software over long periods of time, and utilizing this property to automatically create new versions from old.

N83-120 TITLE: Classification/Document Control Procedures for Tactical Development/Evaluation Support Program

CATEGORY: Management and Support

DESCRIPTION: There is a need to design and evaluate alternative advanced MIS and Library functions that will provide up-to-date and continuous document control systems for TAC D&E Support Program. The design should include a classification system with several indenture levels and cross reference capabilities,; a procedure that will maintain positive control over documents in the system, yet allow system user to retrieve documents quickly and accurately. In addition the system should be compatible with related agency internal MIS Systems for contract monitoring and budget control as well as interface with the Naval Tactical Support activities document system.

N83-121 TITLE: Quantitative Non-Destructive Evaluation of Composite Materials

CATEGORY: Research

DESCRIPTION: Graphite-epoxy composite materials are increasingly being used in critical Naval structures and structural components in view of their high specific strength and high specific modulus. In order to ensure and asses the integrity of these graphite-epoxy structures, reliable methods for the detection and characterization of damage, need to be developed. These Non-Destructive evaluation methods, preferably noncontacting or non-invasive, should

be suitable for field application and should yield reliable quantitative information regarding the size, orientation and location of flaws.

N83-122 TITLE: Photoelectrochemistry

CATEGORY: Research

DESCRIPTION: The Navy's complex weapon, propulsion, communication and sensing systems require specialized electrochemical power sources and processes. Progress in the development of new electrochemical power sources and processes requires a better understanding of the chemical and physical structure of electrochemically reactive materials and of the rates and mechanisms of the electrode processes involved. One area of electrochemical research currently of interest is photoelectrochemistry. Information needed in this area includes:

the electrochemical behavior and stability of semiconductor materials in photoelectrochemical processes; techniques for preparing chemically-modified photoelectrochemical processes occurring in nonaqueous-based electrolytes and the impact of such process on the operation, efficiency and reliability of photostudies of well characterized photoelectrodes, the development of the theory of the process, the electrode-electrolyte interface and the adsorption of molecules at the electrode surface. Aspects of photoelectrodechemistry related to the chemistry of etching, degradation and processing of electronic materials and the development of application concepts based on photoelecrtochemical processes are of interest.

N83-123 TITLE: Hydrodynamics

CATEGORY: Research

DESCRIPTION: Hydrodynamic research areas of interest include the fundamental mechanics of fluids and ship hydrodynamics. Work in the fundamental mechanics of fluids should be generic in nature, serving to advance the knowledge of basic fluid physics and to provide the foundations for advanced ships, propeller and underwater weaponry designs. Specific areas of effort include theoretical and experimental research on such phenomena as turbulence, transition, boundary layers, cavitation, cavity flows, separation and wakes. Work in the ship hydrodynamics should specifically address the basic issues unique to the hydrodynamic performance of Navy ships and submarines. Included here are wave resistance, drag reduction, hull/wake interactions, and hull/propeller interactions for prediction of ship resistance, ship motion and propeller performance.

N83-124 TITLE: Techniques for Test-Scale Equating for Computerized-Adaptive Testing

CATEGORY: Research

DESCRIPTION: There is a strong possibility that the Defense Department will be using item-response theory to adaptivity administer and score its entrance tests beginning sometime in 1985. If this happens, it is anticipated that the periodic development of new test forms will be obviated and that instead, new test questions will be added to the pool and old ones deleted from the pool continuously. This process of continuously changing the item pool, and therefore the test, raises a number of theoretical and practical questions concerning the stability of the subtest and composite equatings.

Test equating is the process through which scores on the psychological test are mapped onto scores on a second equivalent test. Test equating is most often used when old test forms are to be replaced with new test forms or when a ser of equivalent tests are to be used interchangeably. In these circumstances, test equating is often the primary means of establishing both the norms for, and the validity of, a new test. If, through a succession of equatings, the score scales drift, the validity of the norms and the relevance of the validity data must be questioned.

With a traditional approach to test development, score-scale drift is sometimes reduced by equating successive new test forms back to the same anchor test. In the adaptive-testing environment described above, this process is

impractical for it would require a new equating study of each time a test question is added or deleted from the pool. A new test-equating technology is one possible solution, but not necessarily the only one, to the problem discussed above.

N83-125 TITLE: Integrated Logistic Support Plan (ILSP) for a Combined MIFASS and TCO System

CATEGORY: Engineering Development

DESCRIPTION: The Tactical Combat Operations (TCO) System is expected to be significantly reduced in scope and combined with the Marine Integrated Fire and Air Support System (MIFASS). The combination of these two systems is possible due to extensive commonality of hardware and software. A decision to combine these two systems is expected soon. The ILSP has been completed for the original TCO reduced. An ILSP will be needed which will combine the logistic support requirements of the current MIFASS System and the projected TCO System.

N83-126 TITLE: Integrated Logistic Support Plan (ILSP) for Joint Tactical Information Distribution System (JTIDS)

CATEGORY: Engineering Development

DESCRIPTION: The Marine Corps will acquire JTIDS Distributed Time Division Multiple Access (DTDMA) terminals to support tactical communication. An ILSP needs to be developed to support acquisition.

The tactical Air Operations Central-85 and the Marine Corps Tactical Air Command and Control Center will be the initial host platforms scheduled for JTIDS integration.

N83-127 TITLE: High Frequency (HF) Log Periodic Array

CATEGORY: Engineering Development

DESCRIPTION: As requested by the reference, the requirements exists to upgrade the quality and reliability of long distance (HF) transmission paths for MAB/DIV/MAW/FSSG units which is at present marginal to unsatisfactory. This requirement will be improved by the procurement of a highly directional, sky wave propagating, log periodic HF antenna system capable of high gain at low take off angles. Desired characteristics are as follows:

a. Trailer mounted base, transportable in a ton vehicle (M-923).
b. Telescoping mast to a minimum height of 40 feet.
c. Mast head capable of being rotated from ground while antenna is erect.
d. Antenna must be compatible with current and projected HF radio equipments.

N83-128 TITLE: Voiceware Development System

CATEGORY: Advanced Development

DESCRIPTION: the system will be utilized with the Simulated Anti-Armor Gunnery System (STAGS) . The system should allow tank/anti-tank gun crewmen the ability to give and receive verbal commands to a computer either individually or as a crew.

N83-129 TITLE: Development of a Prototype Acoustic Detection System

CATEGORY: Advanced Development

DESCRIPTION: the Acoustic Detection System (ADI) is a small, lightweight, man-portable sound amplified system to extend hearing range by a factor of two. Hand-held or clipped to the rifle, it will amplify sound to the user via cables and headphones, and will be frequency reduction circuit to the 15Hz to 15KHz region. A noise limiting circuit in the headphones will automatically switch-off if the amplified earphone noise level exceeds 85-90 db.

N83-130 TITLE: Development of a Prototype Helicopter landing Zone Lighting System

CATEGORY: Advanced Development

DESCRIPTION: The HLZ Lighting System is a small lightweight system for use on night helicopter assaults when pilots are wearing Night Vision Goggles (NVGs). Each light must be capable of directional illumination and remote activation by a coded radio beacon. The system must not "white out" the NVGs or impair normal night vision.\

N83-131 TITLE: Tactical Weapons Effectiveness Study of Anti-ship Missile Systems Using Automatic Target Recognition

CATEGORY: Exploratory Development

DESCRIPTION:

1. The Cruise Missile type weapons systems are pushing the target engagement range further and further out. The search area within the uncertainty ellipse gives a low probability of detecting the target ship from other ships I the background. The weapon effectiveness I terms of numbers of missiles to sink the right ship, i.e., surgically strike the threat ship, will be greatly improved in the missile can discriminate and recognize the target ship.
2. A weapons effectiveness analysis is required to show the relative benefits of missile system with and without (1) automatic ship recognition, (2) range data and assuming both Non-Cooperative Target Recognition (NCTR) and cooperative Target Recognition (CTR). Analysis must include the effect of positive logic, i.e., recognize the right hip, and negative logic, i.e., don't know exactly which ship is to be hit its known which ships are not to be hit.

NOTE: This effort will require Secret clearance or real cruise missile or HARPOON parameters are used vice a generic missile.